1. A method of performing corneal refractive surgery by reshaping a portion of a corneal surface comprising the steps of:

selecting a laser having a pulsed output beam of predetermined ultraviolet wavelength and having an energy level [less than] <u>of no greater than</u> 10 mJ/pulse;

selecting a scanning mechanism for scanning said selected laser output beam, said scanning mechanism including a galvanometer scanning mechanism for controlling said laser beam into an overlapping pattern of adjacent pulses;

coupling said laser beam to a scanning device for scanning said laser beam over a predetermined surface;

focusing said scanning laser beam onto a corneal surface to a predetermined generally fixed spot size;

aligning the center of the said scanning laser beam onto the corneal surface with a visible aiming beam;

controlling the scanning mechanism to deliver the scanning laser beam in a predetermined overlapping pattern onto a plurality of positions on the corneal surface to photoablate or photocoagulate corneal tissue; and

removing from 0.05 to 0.5 microns of corneal tissue per pulse overlapped to remove tissue to a desired depth, whereby a patient's vision is corrected by the reshaping of the corneal surface of the patient's eye using a low power laser.

<u>24. A method for performing ophthalmic surgery, comprising:</u>

<u>providing a laser outputting a pulsed laser beam having a repetition rate of at least 20 Hz, and an energy level of no greater than 10 mJ per pulse from an output coupler of said laser;</u>

<u>applying said pulsed laser beam onto corneal tissue; and</u>

<u>scanning said pulsed laser beam in a substantially overlapping pattern on said corneal tissue.</u>

25. The method for performing ophthalmic surgery according to claim 24, wherein:

said pulsed laser beam has a repetition rate of at least 50 Hz.

26. The method for performing ophthalmic surgery according to claim 24, wherein:

said substantially overlapping pattern is achieved using randomized scanning of said pulsed laser beam on said corneal tissue.

27. The method for performing ophthalmic surgery according to claim 24, wherein:

said pulsed laser beam has an ultraviolet wavelength.

28. The method for performing ophthalmic surgery according to claim 24, wherein:

said pulsed laser beam has a spot size on said corneal tissue of no greater than 1 mm.

29. The method for performing ophthalmic surgery according to claim 25, wherein:

said pulsed laser beam has a spot size on said corneal tissue of no greater than 1 mm.

30. The method for performing ophthalmic surgery according to claim 26, wherein:

said pulsed laser beam has a spot size on said corneal tissue of no greater than 1 mm.

31. The method for performing ophthalmic surgery according to claim 27, wherein:

said ultraviolet wavelength is in a range of 193 to 220 nm.

32. The method for performing ophthalmic surgery according to claim 24, wherein:

successive pulses of said pulsed laser beam are overlapped at least 50 percent.

33. The method for performing ophthalmic surgery according to claim 24, wherein:

said ultraviolet wavelength is in a range of 193 to 220 nm.

34. The method for performing ophthalmic surgery according to claim 24, wherein:

said pulsed laser beam has a repetition rate in a range of 50 to 200 Hz.

35. The method for performing ophthalmic surgery according to claim 24, wherein:

said pulsed laser beam is scanned synchronously with said pulses of said pulsed laser beam.

36. The method for performing ophthalmic surgery according to claim 24, wherein:

an area of corneal tissue 0.05 to 0.5 microns deep is removed with each pulse of said pulsed laser beam.

39. A method for performing ophthalmic surgery, comprising:

providing a laser outputting a pulsed laser beam having an energy level of no greater than 10 mJ per pulse from an output coupler of said laser; and

scanning said pulsed laser beam in a substantially overlapping pattern on corneal tissue.

40. The method for performing ophthalmic surgery according to claim 39, wherein:

said pulsed laser beam has a spot size on said corneal tissue of no greater than 1 mm.

41. The method for performing ophthalmic surgery according to claim 39, wherein:

successive pulses of said pulsed laser beam are overlapped at least 50 percent.

42. The method for performing ophthalmic surgery according to claim 39, wherein:

said pulsed laser beam is pulsed at a repetition rate of at least 20 Hz.

43. The method for performing ophthalmic surgery according to claim 39, wherein:

said pulsed laser beam is pulsed at a repetition rate of at least 50 Hz.

44. The method for performing ophthalmic surgery according to claim 39, wherein:

said pulsed laser beam is scanned synchronously with said pulses of said pulsed laser beam.

45. The method for performing ophthalmic surgery according to claim 39, wherein:

an area of corneal tissue 0.05 to 0.5 microns deep is removed with each pulse of said pulsed laser beam.

sub C3

48. A method of performing laser ablation on tissue, said method comprising:

providing a laser having a pulsed output beam of ultraviolet wavelength and an output energy level of no greater than 10mJ per pulse from an output coupler of said laser;

providing a galvanometer scanner; and

controlling said pulsed output beam with said galvanometer scanner to provide a substantially overlapping pattern of beam pulses on said tissue.

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sub D6

49. The method of performing laser ablation on tissue according to claim 48, wherein:

an orientation of said substantially overlapping pattern is achieved using randomized scanning of said pulsed output beam on said tissue.

50. The method of performing laser ablation on tissue according to claim 48, wherein:

said pulsed output beam has a pulse repetition rate of at least 20 Hz.

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56. The method of performing laser ablation on tissue according to claim 48, wherein:

said pulsed output beam is pulsed at a repetition rate of at least 50 Hz.

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59. The method of performing laser ablation on tissue according to claim 50, wherein:

said pulsed output beam has a spot size on said tissue of no greater than 1mm.

61. The method of performing laser ablation on tissue according to claim 49, wherein:

said pulsed output beam has a repetition rate of at least 20 Hz.

62. The method of performing laser ablation on tissue according to claim 57, wherein:

said pulsed output beam has a repetition rate of at least 20 Hz.

69. An apparatus for ablating tissue, comprising:

a laser adapted to emit a pulsed output beam having an ultraviolet wavelength and a repetition rate of at least 50 Hz; and

a scanner constructed and arranged to control said pulsed output beam into a substantially overlapping pattern of beam pulses on said tissue.

70. The apparatus for ablating tissue according to claim 69, wherein:

said substantially overlapping pattern of beam pulses has an orientation which is achieved using a randomized scanning of said pulsed output beam on said tissue.

76. An ophthalmic surgery apparatus for performing corneal refractive surgery by reshaping a portion of a corneal surface, said apparatus comprising:

a laser adapted to emit a pulsed laser beam having an energy level of less than 10 mJ per pulse from an output coupler of said laser; and

a computer-controlled scanning device coupled to said laser to cause overlap of pulses of said pulsed laser beam on said corneal surface to achieve a smooth ablation of corneal tissue.

77. An ophthalmic surgery apparatus for performing corneal refractive surgery by reshaping a portion of a corneal surface according to claim 76, wherein:

said pulsed laser beam has a repetition rate of at least 20 Hz .

sub C6

78. A method of performing corneal refractive surgery by reshaping a portion of a corneal surface, said method comprising:

substantially overlapping a plurality of ultraviolet laser beam pulses over an area of a corneal surface sufficient to ablate a depth of between 0.05 and 0.5 microns of corneal tissue per ultraviolet laser beam pulse;

said laser beam pulses having an energy level of no greater than 10 mJ per pulse from an output coupler of said laser; and

said laser beam pulses having a pulse repetition rate of at least 50 pulses per second.

B10 Cont.

79. The method of performing corneal refractive surgery by reshaping a portion of a corneal surface according to claim 78, wherein:

said laser beam pulses have a wavelength in a range of 193 to 215 nm.

sub C7

82. An ophthalmic surgery apparatus, comprising:

a laser adapted to emit a pulsed beam of less than about 10 mJ per pulse at an output coupler of said laser; and

a computer-controlled scanning device coupled to said laser such that pulses of said beam are substantially overlapped to achieve a smooth ablation of corneal tissue.

B11

84. The ophthalmic surgery apparatus according to claim 82, wherein:

said laser is adapted to emit a pulsed beam having an ultraviolet wavelength.

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86. The ophthalmic surgery apparatus according to claim 82, wherein:

said laser is adapted to emit a pulsed beam having a repetition rate of at least 20 Hz.

90. A method for performing corneal refractive surgery by reshaping a portion of a corneal surface, comprising:

selecting a laser having a pulsed output beam of ultraviolet wavelength and having an energy level less than 10 mJ/pulse from an output coupler of said laser;

selecting a scanning mechanism for scanning said laser output beam;

coupling said laser beam to said scanning mechanism for scanning said laser beam over a predetermined surface;

focusing said scanning laser beam onto said corneal surface;

controlling said scanning mechanism to deliver the scanning laser beam in an overlapping pattern onto a plurality of positions on said corneal surface to at least one of photoablate and photocoagulate corneal tissue; and

removing from 0.05 to 0.5 microns of corneal tissue per pulse overlapped to remove tissue to a desired depth, whereby a patient's vision is corrected by said reshaping of said portion of said corneal surface of said patient's eye.

91. A method for performing ophthalmic surgery, comprising:

pulsing an ultraviolet laser beam having an output energy level of no greater than 10 mJ/pulse from an output coupler of said laser;

applying said pulsing ultraviolet laser beam onto corneal tissue; and

scanning said pulsing laser beam in a purposefully substantial overlapping pattern on said corneal tissue.

B14 Cont.

92. The method for performing ophthalmic surgery according to claim 91, wherein:

said pulsing ultraviolet laser beam has a wavelength in a range of 193 to 215 nm.

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95. The method of performing ophthalmic surgery according to claim 91 86, wherein:

said substantially overlapping pattern is achieved using a randomized scanning of said pulsing laser beam on said corneal tissue.

B15

96. The method of performing ophthalmic surgery according to claim 91, wherein:

said pulsing ultraviolet laser beam has a wavelength of 193 nm.

100. A method for performing photocoagulation on a corneal surface according to claim 99, wherein:

said infrared laser beam is emitted by a diode laser having a wavelength in a range of 1.9 to 2.5μm.

Kindly add the following new claims 105 and 106.

Sub D17

--105. The method for performing corneal refractive surgery according to claim 90, wherein:

said scanning mechanism comprises a galvanometer.

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106. The method for performing corneal refractive surgery according to claim 90 83, further comprising:

aligning a center of said scanning laser beam onto said corneal surface with a visible aiming beam.--

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